

Description

Recreational Vehicle (RV) Portable Sunscreen Canopy

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Patent Application Ser. No. 60/481,093, filed July 15, 2003 the entire contents of which are herein incorporated by reference.

FEDERAL RESEARCH STATEMENT

[0002] Statement of federally sponsored research/development (if any). None

BACKGROUND OF INVENTION

[0003] 1. Field of Endeavor to which the invention pertains:

[0004] Field of Search: 135/87, 88, 114, 117, 118, 128, 146, 157, 905, 908; 160/370; 47/31; 296/136.

[0005] The present invention relates to a flaccid, porous, portable recreational vehicle sunscreen that can be used for shading a self-propelled recreational vehicle from heat and ul-

tra violet sunrays, but only while the vehicle is parked. This apparatus is supported by attaching the sunscreen to tent poles which in-turn are inserted into permanent, tent pole mounting extrusions that have been affixed at selected locations on the vehicle symmetrical to grommets that have been manufactured in the canopy. When the tent poles are inserted into the extrusions, and the canopy is attached as shown in this embodiment, the vehicle should not be driven on U.S. highways; only after the tent poles and canopy are disassembled and stored.

[0006] The age old problem of reducing heat internal to a large enclosed vehicle is addressed and solved by applying horticulture experience in managing ultra violet rays and heat the same as one would use in plant propagation technology. The use of a greenhouse flaccid, porous shade material as a canopy permits one to greatly reduce the problems of heat and ultra violet rays which causes external RV accessory damage, such as air conditioner shrouds, vent covers, and luggage carriers, as well as internal cabin accessory and decor damage, such as vehicle dash, seat-covers, and window curtains. This type of canopy is not subject to wind shear problems as is one made from impermeable cloth. The mechanical challenge is to affix the

said canopy above an RV, or large vehicle, in an economical manner without using a sophisticated frame, rib or retraction mechanism. The canopy support structure must be light weight and portable presenting a minimum setup and takedown effort. Applying a simple tent pole methodology with pre-positioned extrusions attached to the vehicle in locations symmetrical to the grommets in the canopy avoiding vehicle structure obstacles solves this mechanical problem. Curved tent poles support the canopy over the sides of an RV outward for one to two feet for added shade benefit. The attachment of this invention to an RV generates greater vehicle internal cooling capability by reducing external heat and ultra violet rays which cause internal cabin temperature to rise greater than the external temperature. A direct positive effect is realized on the air conditioning within the confines of the vehicle by applying this apparatus. With the flaccid canopy in place, the problems caused by ultra violet rays and excessive heat are reduced.

[0007] Also, by attaching short, light weight tent poles to the upper part of a large vehicle, the overall weight of the sun-screen canopy and supporting paraphernalia is reduced for portability, set-up and disassembly efforts.

[0008] Prior art does not economically address the coverage of a large vehicle such as a recreational vehicle with an ultra violet rays and heat reducing flaccid canopy. Prior art findings reflect designs based on umbrella technology which includes flexible sheets affixed to radial arms hinged to a hub for extending the invention lateral to an upright plurality of mast to provide shade. This type of art does not meet specifications for an RV sunscreen canopy because of the impact of mounting such an invention over twelve feet above ground level to function on top of an RV. Additionally, once installed, the apparatus is subject to becoming a problem because of wind shear factors and damage to the RV structure.

[0009] Other embodiments reflect designs that use extensive masts, hubs, and stays of a composite metal structure to provide the necessary strength to support a sunscreen canopy. An application of the canopy using such embodiments may pose a problem similar to a giant lightening rod mounted on top of an RV. Most damage, other than collision type accidents, to a recreational vehicle emanates from lightening strikes. The second most frequent cause of damage is from heat and ultra violet rays. A permanently mounted frame, retractable box mechanism, or

mast to the roof of an RV could cause additional damage considerations such as hanging on low tree-limbs, or wind shear driving at 60 miles per hour. Category 1 hurricane winds are from 74 to 95 miles per hour with wind shear to unanchored homes being a primary damage area. A vehicle traveling at 60 miles per hour into a 20-knot headwind creates the equivalent of a hurricane force against high objects mounted on the roof of an RV with subsequent damage.

[0010] Prior art does not address heat destruction problems when a vehicle is stored in a driveway or storage lot, and is closed for an extended period. Nor does the prior art cover benefits of reduced cooling expense in that the RV air conditioner system is more efficient with a canopy as proposed in this invention.

[0011] Using prototype version 11 as presented in the art of this invention, resulted in an internal cabin temperature drop as high as a 27-degrees over the same time frame without the prototype canopy installed. The actual heat reduction will always be contingent on outside air motion, humidity, and other environmental attributes including locations in addition to the flaccidity of the canopy as installed. The same prototype, with its porous shade cloth, withstood a

60-knot wind gust during an extremely inclement weather event.

[0012] 2. References to specific problems involved in prior art:

[0013] The following patent artwork does not address wind shear problems, or damage of external and internal accessories from excessive heat and ultra violet rays. Abatement of the excessive heat issue to assist in internal cooling of an RV is not addressed. Examples are disintegration from ultra violet rays of roof-mounted air conditioner and vent shrouds, severe fading of window curtains, shades, and window treatments, and destruction of vehicle dash and upholstery material.

[0014] U.S. Pat. No. 553,735 issued Jan. 28, 1896 to J. Murgatroyd, disclosed and taught an attachable sunshade for bicycles. The canopy is supported by a staff similar to an umbrella staff that is not feasible in a tall recreational vehicle, and this embodiment does not address assisted cooling of an internal cabin.

[0015] U.S. Pat. No. 2,508,757 issued May 23, 1959 to O. A. Gray, disclosed and taught an automobile sun protection apparatus for automobiles. The canopy is supported by mast attached to the front and rear bumper and to left and right door handles. The sun protection apparatus is

attached to a frame attached to the four masts. Bumper and door handle mounting of a very large canopy as required for a large vehicle is impractical because of height, width, length, and in some cases, only a single door.

[0016] U.S. Pat. No. 3,349,784 issued Oct. 31, 1967 to C. G. Roberts, disclosed and taught a shelter attachment for automobiles. Said shelter attachment is fastened to the automobile top and to one-side fender wells with lanyards. Engineering this invention to function with a twelve foot high, eight foot wide, and up to forty-five foot long recreational vehicle poses both a structural challenge and a wind shear resolution challenge.

[0017] U.S. Pat. No. 4,184,501 issued on Jan. 22, 1980 to Johnson, discloses a flexible shield material having the characteristic of not transmitting solar heat and which is supported on a frame arched over a vehicle from end to end with the opposite ends hooked to the front and rear bumpers and adapted to be locked. This embodiment becomes impractical in that flexible, telescoping, and arched tubes over an enormous vehicle such as an RV will not support the length, and height because of wind shear problems.

[0018] U.S. Pat. No. 4,432,581 issued Feb. 21, 1984 to Guma

disclosed a vehicle cover with automatic extending and retracting mechanical aspects. Applying this embodiment to the roof of an RV would be like having a large wind-resisting box mounted on approximately one half of the roof. The apparatus would be in the retracted form while motoring down the highway, that would pose a structural damage problem to the roof of an RV because of weight and wind shear from vehicle movement at a high speed.

[0019] U.S. Pat. No. 4,605,030 issued Aug 12, 1986, to J. K. Johnson, disclosed and taught a portable erectable shelter structure primarily designed as a sunshade for automobiles consisting of upright masts anchored to the ground by the weight of the four vehicle wheels on support pads, and a shade fabric stretched between front and rear sets of masts and cross members. Masts sufficient to support shade material from ground level to a twelve-foot height would be beyond the capability of many RV owners to erect. It lacks portability when engineered to the size required to cover an RV. Additionally, wind shear engineering factors are not met with the height, width, and length considerations for adapting the embodiment to an RV solution.

[0020] U.S. Pat. No. 4,644,236 issued to Apr. 7, 1987 to Dorame

disclosed a portable carport with four telescoping assemblies supported by attaching them to the vehicle's wheels. The impermeable canopy material installed above a long, wide and high RV with four telescoping assemblies supported by the wheels of the vehicle would pose a substantial wind shear problem.

[0021] U.S. Pat. No. 4,684,165 issued Aug. 4, 1987 to Becker defines a cover draped over a roof rack frame and frames attached to either end of the vehicle all of which are attached to the surface of an automobile for retaining the cover. A roof rack large enough to retain a cover over a motor home prohibits the application of this apparatus from being lightweight and portable.

[0022] U.S. Pat. No. 4,805,654 issued February 21, 1989 to Huo-Hsin Wang introduces a three-legged support of a one-mast umbrella apparatus to be mounted on top of a vehicle with suction cups to attach the apparatus to the roof of an automobile. In its present embodiment, it would shade approximately one third of a large recreational vehicle. An adaptation to shade an entire recreational vehicle would pose an engineering problem to solve wind shear dangers.

[0023] U.S. Pat. No. 4,944,321 issued July 31, 1990 to Moyet-Or-

tiz teaches a combined portable vehicle garage and tent structure incorporating support members which are held in place by the vehicle wheels. Wind shear load engineering factors may prohibit such application to enclose a large RV and prohibits the utility of this invention as a portable apparatus for RV owners.

[0024] U.S. Pat. No. 5,197,503 issued Mar. 30, 1993 to Y. L. Chen, disclosed and taught a motorcar sunshade apparatus designed primarily as a sunshade for motorcars. It consists of masts with suction cups to prevent damage to the motorcar paint, and other framing and fastening means to stand the sunshade away from the outer body of the motorcar. The embodiment of masts and suction cups to mount a large shade canopy above a large RV is not economical because time to complete set-up, disassembly, or package the apparatus for transport.

[0025] U.S. Pat. No. 5,241,977 issued Sept 7, 1993, to Flores, et al., disclosed an embodiment of a portable vehicle cover apparatus designed primarily as a sunshade for vehicles consisting of masts anchored to the ground by the weight of four vehicle wheels on support pads, and a shade fabric stretched between front and rear sets of masts and cross members. The problem is that a forty-five foot canopy, or

even a 25-foot canopy, cannot be suspended effectively between four masts. The inset of the rear wheels of some recreational vehicles is such that a mast to be held in place by the rear wheels would need to be approximately 20 feet in length and maintained on a 45-degree slope without flexing. The masts supported by the front wheels would need to be approximately 16 feet in length and held on a 60 to 65 degree slope without flexing. A flexing mast would subject the body of the recreational vehicle to possible impact damage. Wind shear engineering becomes a major consideration when installing a high, narrow, and long canopy such as applying this apparatus as an RV canopy solution.

[0026] U.S. Pat. No. 5,622,197 issued Apr. 22, 1997 to Trevor Valarie, teaches a canopy consisting of a canopy fabric extended between a pair of supports tethered to the ground or posts to provide tension to furl the canopy cloth. Ground mounted post prohibit ease of installation in the case of twelve foot above ground approximate height of an RV that has lengths that can reach forty to forty five feet. Also, wind shear makes such a large tethered apparatus infeasible as an RV shade canopy.

[0027] U.S. Pat. No. 6,089,245 A issued July 18, 2000 to Tseytlin,

teaches an embodiment similar to a large umbrella with a plurality of radial arms hinged to a hub which can either be folded along a two dimensional plane or extended perpendicular to the main mast for shade. Radial arms longer than the mast is tall present an engineering problem for applying this embodiment as an RV cover. For example, an RV can be more than five times longer than it is wide. Additionally, an embodiment large enough to cover an RV becomes a large lightening rod problem as well as subjecting the RV roof to potential damage resulting from wind shear.

[0028] U.S. Pat. No. 6,135,191 issued October 24, 2000 to Mitchell e. a., teaches a collapsible vehicle sunshade assembly based on a central hub methodology and is similar to raising and lowering an umbrella. RV height, width, and extraordinary length would require extensive engineering to implement this embodiment as a collapsible recreational vehicle sunshade.

[0029] U.S. Pat. No. 6,257,262 B1 issued July 10, 2001 to Johnson, teaches an embodiment of a canopy top mounted to a frame adaptable for being secured to a vehicle and supported above the passenger compartment and with enough strength in the integral frame to carry articles on

the canopy. The frame description presents a difficult apparatus to erect and disassemble while vacationing and traveling with the frame permanently installed above RV rooftop accessories. This frame also poses a problem similar to a lightening rod and would be subject to lightening strikes .

[0030] U.S. Pat. No. 6,357,461 B1 issued Mar. 19, 2002 to Lun Chai, et. al., teaches a sunshade designed for shading the interior of a vehicle structure from sunrays. This embodiment falls short of removing heat prior to entry into the confines of a large vehicle through the roof and windshield and the numerous embodiments presented would be cumbersome to quickly install.

[0031] U.S. Pat. No. 6,725,871, issued April 27, 2004, to Shearer , et al., teaches a portable cover structure attachable to boats and the like, or function as a stand-alone cabana or the like, providing a portable enclosure for numerous applications to protect occupants from inclement weather. This embodiment targets small items and occupants to be coverage from inclement weather. The embodiment would pose an enormous wind shear problem because of physical size required to apply it as an RV canopy. The non-porous material proposed as the canopy large enough to

cover an RV poses an engineering problem to solve for wind shear.

[0032] As can be seen by the referenced art, features embodied in the present invention are not covered. Prior art constructed with large frames mounted from ground level, or an umbrella embodiment mounted from rooftop level, pose an enormous installation and disassemble problem, as well as a danger from wind shear against such embodiments. Frames cause a further problem related to damage from lightening strikes and resulting damage to electrical circuits, appliances, generators and furnaces.

[0033] None of the prior art presents extrusions and curved, short, light tent poles mounted to a recreational vehicle side for attaching a lightweight sunscreen canopy in a loose configuration above a large vehicle. This prior art does not claim a methodology for reducing ultra violet rays and heat emanating from sunshine, nor to provide damage abatement for vehicle accessories, both internal and external. Prior art does not adequately address the wind shear abatement when using canopies for vehicles that are very large. And, most of all, increased occupant comfort inside the vehicle based on improved air conditioning is not solved with the referenced art.

SUMMARY OF INVENTION

[0034] The objectives of the Recreational Vehicle (RV) Portable Sunscreen Canopy is to providing a sunshade that has a protective shade fabric and a plurality of tent poles with corresponding extrusions for mounting the flaccid canopy at a constant level above accessories on the top of a recreational vehicle in a manner that eliminates wind shear. Protection by blocking sun and ultra violet rays applies to vehicles parked and in use, or while they are parked for storage and are closed. It is an objective of the invention to provide a solution that can be associated with any length of recreational vehicle to reduce heat and ultra violet rays thereby preventing external accessory damage as well as reducing heat internal to the vehicle and further reducing damage, while not posing a wind shear problem. A direct benefit of heat reduction is to lessen the cost of cooling the internal cabin with the vehicle's air conditioner.

[0035] The ultimate user determines which configuration meets the respective user's need based on the height, width, and length of the target vehicle. Prior inventions and art do not address the problem of aged consumers mounting a flaccid sunscreen canopy above a large vehicle which is

approximately twelve feet in height, eight feet in width, and can range from 20 to 45 feet in length. This invention has an approximate canopy and mounting bracket configuration combined weight of 20 to 40 pounds.

[0036] Additionally, pre-installed RV accessories on different brands and models of recreational vehicles will dictate the installation of the sunscreen canopy to prevent vehicle damage. The flaccid canopy is designed with different numbers of extrusions and tent poles and different lengths of shade material to correspond with the many varied widths, heights, and lengths of recreational vehicles. The size of the vehicle and the location of pre-mounted accessories dictate the installation of the sunscreen fabric and the associated tent poles. The respective vehicle owner chooses the correct configuration for employment of the invention.

[0037] The objectives of damage abatement to external and internal accessories, heat reduction, and improved air conditioning are achieved with this invention. Additionally, the potential of a wind shear problem found with impermeable models is eliminated.

BRIEF DESCRIPTION OF DRAWINGS

[0038] FIG. 1 is a perspective view of a flaccid, porous shade

cloth with grommets, and with emphasis on its use as a large recreational vehicle shading canopy .

[0039] FIG. 2 is a perspective view of the extrusions that are to be mapped to grommets in the shade cloth and mounted permanently to the RV and to which the tent poles are inserted to hold the shade cloth at a horizontal plane above rooftop accessories. Pluralities of the extrusions, tent poles, and ties or bungee cords are used to secure the canopy in place above the respective RV clear of the vehicle-mounted accessories. The ball bungee cord is used only for presentation and is not a claim of this invention in that it is a currently patented commercial product.

[0040] FIG. 3 is a perspective view of the lateral mounted shade apparatus over a silhouette of a recreational vehicle. The silhouette of the RV is not a claim within the embodiment of this invention and is used only for presentation.

[0041] FIG. 4 depicts a close-up view of a reinforced corner of the flaccid shade cloth with grommets, as it would be attached to a tent pole with a tie or bungee cord.

[0042] FIG. 5 depicts a close-up view of the lower end of a tent pole and extrusion to secure the tent pole to the upper side of the vehicle sufficient to clear the flaccid sunscreen canopy above obstacles on the roof of the vehicle such as

air conditioners, luggage carriers, and vent covers.

DETAILED DESCRIPTION

[0043] FIG. 1 demonstrates the use of the sunscreen fabric 14 that is fashioned from flaccid, porous commercial horticultural growers shade material having a 60 % shade, 70% shade, 80% shade or 90% shade characteristic. The embodiment in FIG. 1 can be constructed from a lesser-cost black flaccid shade cloth, or a more expensive aluminum based flaccid shade cloth. The embodiment is manufactured with a reinforced fabric webbing bound around all sides 13, either glued or sewn, with the respective four corners of the fabric webbing overlapped for added strength. The added binding around all four sides provides strength necessary for installing grommets 12 at predetermined locations in the cloth when it is constructed. The corners and other selected grommet locations are fastened to tent poles without the need for reinforcement bars structured into the fabric webbing or ribs used to support across the rectangle flaccid shade fabric. Grommets 12 are installed after the cloth is fabricated in each of the four doubled bound corners and approximately every two feet across each short end of the rectangle and down each long side of the rectangle sunscreen

canopy 11 thereby permitting the connection to the tent poles and extrusions installed at user selected locations on the RV.

[0044] FIG. 2 depicts the tent pole 22 used to raise the sunscreen canopy to an acceptable height above a vehicle top with an outward curve at a 90 degree bend to permit overhang of the sunscreen fabric to either side, front, and rear of the targeted vehicle. A commercial eyelet bolt 21 is placed in the upper end of the tent pole for fastening the sunscreen canopy with some type of strap, bungee cord, ball bungee cord 25 or string fastener. A slot is cut into the bottom end of the tent pole 22 to correspond to the retainer pin 24 inserted through the reception hole 28 of the mounting extrusion 23. The tent pole mounting extrusion 23 is mounted to an acceptable area of the targeted vehicle through mounting holes 27 by using two number 10 or two number 12 screws approximately 2 inches long suitable for fastening to wood, fiber glass, or metal.

[0045] FIG. 3 includes a silhouette 5 drawing of a recreational vehicle with the sunscreen canopy 11 outlined in FIG. 1 mounted to a plurality of tent poles 22 using appropriate straps or bungee cords 25 with the tent poles 22 being

mounted near the top sides of the RV 2 in sufficient pluralities to maintain the flaccid sunscreen canopy horizontally above rooftop accessories. There is no requirement to stretch the flaccid , porous shade cloth taut in that a loosely fluttering canopy will create an additional pumping and cooling effect with minimum breeze as desired of the embodiment. Also, the porous sunscreen canopy 11 is mounted in a horizontal manner to decrease the possibility of wind shear. This figure represents an RV that is approximately 24 feet in length with tent poles being mounted approximately 12 feet apart covering the length of the RV. A longer RV would require an additional plurality of the tent mounting poles 22 and extrusions 23 to sufficiently attach the appropriate length of sunscreen canopy. Additionally, if the vehicle end user wishes to extend the said flaccid shade cloth over the windshield approximately four additional feet, an additional plurality of tent poles 22 and extrusions 23 are required.

[0046] FIG 4. is an exploded view 1 of the upper end of the tent pole 22 connected to the FIG. 1 sunscreen apparatus 11 using a ball bungee cord 25. A bungee cord, strap, or tie is threaded through the eyelet bolt 21 mounted at the top, outer end of the tent pole 22 and threaded through grom-

met 12 embedded in the sunscreen canopy material edge binding 13 and fastened to hold the sunscreen canopy 14 in a horizontal manner above a vehicle. A commercial ball bungee cord is preferred in that the elastic tension causes the flaccid sunscreen to flutter with ease thereby enhancing the cooling effect desired by the embodiment.

[0047] FIG 5. is an exploded view 2 of the lower end of tent pole 22 and mounting extrusion 23 secured to the side of a vehicle as depicted in FIG. 3. The slotted end 26 of tent pole 22 is inserted into the receiving socket of the extrusion astride pin 24 to secure the tent pole in place based on tension from the attached flaccid sunscreen 11. The extrusion 23 is secured to the upper side of an RV at the drip rail level and where a solid upper structure is located by using two number 10 or number 12 screws approximately 2 inches in length and appropriate for fastening items to wood, fiberglass, or metal. The extrusion 23 is permanently mounted in selected locations matching grommet locations in the canopy cloth. The tent poles 22, fasteners 25, and sunscreen canopy 11 can be detached, folded, and bundled for storage in a carrying compartment, trunk, or under a couch or bed in the vehicle.

[0048] This invention has the following advantages, as under-

stood from the above description.

- [0049] a. It has a combined weight consisting of canopy, tent poles, and tie straps of between twenty and forty pounds depending on overall length.
- [0050] b. It can be carried, in a collapsed form, on top of a vehicle tied to a luggage rack, in an RV storage compartment, in a vehicle trunk, or under a couch or bed inside an RV.
- [0051] c. It can be moved to any location for use by erecting it as prescribed.
- [0052] d. It can be installed and used while occupants are relaxing or vacationing in a recreational vehicle.
- [0053] e. It can be used for damage abatement purposes while a vehicle is in storage or parked for extended periods.
- [0054] f. It provides resolution of the age-old damage problem from excessive heat and ultra violet rays, and enhances the cooling capability of a recreational vehicle's air conditioning system.
- [0055] g. By the nature of the porous, flaccid sunscreen material, a potential wind shear problem is avoided and the prototype has been successfully tested in 60 Knot winds during extremely inclement weather.
- [0056] Although the present invention has been described above in terms of a specific embodiment, it is anticipated that

alterations and modifications thereof will no doubt become apparent to those skilled in the art of construction of such flaccid shade material, mounting paraphernalia and extrusions. Additionally, those skilled in the art can easily adapt alternate methods of creating the canopy structure necessary to install the shade screen above a vehicle such as wheel mounted or ground mounted tent poles, electric awning rollers, and the like. It is therefore intended that the following claims be interpreted as covering all such alterations and modifications as falling within the true spirit and scope of the invention.